

Looking Back and Looking Ahead

Unit Review

In this unit, you studied some basic ideas of algebra. You learned ways to use those ideas to solve problems about variables and the patterns relating variables. In particular, you studied how to

- recognize situations in which changes in variables are related in useful patterns
- describe patterns of change shown in tables and graphs of data
- construct tables and graphs to display relationships between variables
- use algebraic symbols to write equations relating variables
- use tables, graphs, and equations to solve problems
- use a graphing calculator to construct tables and graphs of relationships and to solve equations

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Use Your Understanding: Algebraic Reasoning

To test your understanding of algebraic ideas and your skill in using algebraic techniques, consider how algebra is involved in a business we all depend on—the shipping of packages from town to town, across the country, and around the world.



1. A shipping company offers two-day shipping of any package weighing up to 2 pounds for \$5 plus \$0.01 per mile.

a. Copy and complete the table.

Two-Day Shipping Costs

Distance (mi)	100	200	300	400	500	1,000	1,500	2,000
Shipping Cost	■	■	■	■	■	■	■	■

- b. Describe the pattern by which the shipping cost increases as the shipping distance increases.
- c. Make a graph showing shipping charges for distances from 0 to 2,000 miles. Use appropriate labels and scales on the axes.
- d. Write an equation for the relationship between distance d in miles and shipping cost c in dollars.
- e. Use a graphing calculator and the equation in part (d) to check the graph you made in part (c).
- f. Use the table, graph, or equation to find the cost to ship a 1-pound package 450 miles.
- g. Use the table, graph, or equation to figure out how far you can ship a 2-pound package for \$35.



Explain Your Reasoning

Answer the following questions in your own words to summarize what you know about variables and patterns.

- What does the word *variable* mean in algebra?
- What are *dependent* and *independent variables* and how are they usually related to each other in a problem situation?
- Give examples that show at least two common patterns that occur in the values of related variables.
- What are the main decisions and procedures involved in making a table to illustrate the relationship between two variables? How does a table help you describe and study a relationship?

6. What are the main decisions and procedures involved in making a graph to illustrate the relationship between two variables? How does a graph help you describe and study a relationship?
7. What are the main decisions and procedures involved in writing an equation to illustrate the relationship between two variables? How does an equation help you describe and study a relationship?
8. How can you use a graphing calculator to study relationships between variables? What do you need to know about a situation in order to use a calculator? How can the calculator be used to solve problems about variables and relationships?

Look Ahead

Your understanding of algebraic ideas and skills will grow as you work on future *Connected Mathematics* units. You will use variables and symbolic expressions in the geometry unit *Stretching and Shrinking*, the proportional-reasoning unit *Comparing and Scaling*, the algebra unit *Moving Straight Ahead*, and all units in the next *Connected Mathematics* course.